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GEOSCIENCE LIBRARIES: STILL IN A TIME OF CHANGE

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Abstract – For the past 37 years, the Geoscience Information Society members have been documenting change and making predictions for the future of our libraries and information centers. The card catalog has become an OPAC, the Bibliography and Index of Geology is now GeoRef, and the reference questions that once came in person or by telephone now come via e-mail, IM, Chat, and occasionally in person.

After an analysis of the subject content of the papers presented to the Geoscience Information Society from 1969 through 1993, Derksen and O'Donnell (1995) made some predictions for the geoscience information center in the year 2000. The analysis of the papers presented after 1993 show some shift in their trends and topics, but their predictions have come to pass. This paper presents the new trends and makes new predictions for the Geoscience Library in the year 2017.

INTRODUCTION

When I started on this research, I did not realize that by 2017, the Geoscience Information Society will have celebrated its fiftieth anniversary. We have seen a lot of changes in the past years, and there are more to come. What are these changes, and where are we heading? Charlotte Derksen and Jim O'Donnell in their paper in 1995 looked back 25 years to see what we had been doing and then make some predictions for the year 2000 as to what we would be doing. They also had a "wish list" for what they wanted to see before 2000.

1994 predictions for year 2000

1. We will be answering questions.
2. We will be looking for space.
3. We will be developing collections in more formats than paper.
4. We will be training and assisting patrons to use tools.
5. We will be getting information for users.
6. We will be trying to get more equipment and current equipment.
7. Bibliographic databases will continue to proliferate.
8. More digital databases.
9. More books, journals, and maps will be available electronically.
10. Books and journals will still arrive in paper.
11. Cataloging and indexing will be more automated, more complex, and more important.
12. Archiving and preserving information will be more vital as we deal with new formats.
13. Providing access to information for remote users.
14. Seamless information environment.

Wish List for year 2000

1. Online theses and dissertations.
2. Online technical reports.
3. Easy GIS software that can be used by anyone to produce a map in the same time it takes to find a printed map in a drawer.
4. Compatibility of platforms and formats for documents on servers.
5. Core journals available electronically, at flat fee prices.
6. Photocopiers in libraries that automatically scan any document photocopied for retention into the "library of electronic documents." Copyright is an issue here as well as privacy.

I feel that by 2000 or at least by 2007 we have achieved most of these. So what have we been doing since 1994 to get to this point? Where are

we now? Where are we going in the next 10 years?

PAST ACTIVITY

What have we been doing for the past 13 years?

A review of the papers presented at the Geoscience Information Society meetings from 1994 through 2006 gives a snapshot of what has been happening in our profession. We have continued to report on many of the traditional "library" things such as collection analysis, database development, serial prices, bibliographic instruction, and preservation. But new technology has changed how we do these things and introduced us to new things to do.

Databases have gone through four stages of change:

1. Print bibliographies;
2. Electronic bibliographies with online searches done on demand through a vendor;
3. Bibliographies issued on CD-ROMs that we had to figure out how to network in our libraries; and finally
4. Bibliographies on the web with the end user doing the searching (Andrews, 1995; Tahirkheli and Andrews, 1999).

Journals were only in print, and now some are only online or the online version is the version of record (Holoviak, 1995; Mosher and Gries, 2003) .

GIS used to stand for our society, the Geoscience Information Society. Now GIS is *geographic information systems* and more and more we are dealing with GIS data needs of our users (Levine et al, 1996; Larsgaard, 1997).

Preservation has continued to be a concern but we have moved from problems of color maps on microform to being able to scan and produce digital copies (Wishard and Musser, 1999). Preservation issues now include how to handle data such as drill cores, well logs, computer files, fossil and rock specimens as well as paper reports, maps, photographs, and books (Blome et al, 1999; Browne and Love, 1997; Gilbert, Packard, and Dustman, 2002).

Several papers described new or renovated library space, the library as place continued to be important even as virtual libraries were being created (McLeod and Dubberke, 2001; Scott, 1999; Triplehorn, 1997).

The World Wide Web moved into our lives during this period. Papers were presented on developing web pages and services and have included our role in development of digital libraries and databases on the web (Buttenfield and Larsen, 1997; Hallmark, Masterson, and White, 1996; Musser, 1996).

Serial prices have continued to be a topic of discussion but the focus has changed from the rising prices to include online access, archiving, licensing, copyright, and package deals (Duranceau, 2001; Wesley and O'Donnell, 1999).

We have watched as our collection scope has changed from geology to geological sciences to geoscience to earth science to earth system science, ever broadening and challenging (Musser, 1997).

TODAY

The 2007 Geoscience Library

The Library as place still exists, but the collection is downsized. Remote storage is available for less used materials or print material that is now online. Many serials now are online only. Either they are published online as electronic journals or the print subscriptions have been cancelled to pay for the online access and to save binding cost and shelf space. Remote access to the electronic journals and databases is available to registered users from anywhere in the world via proxy server authentication. The Library is probably a member of a consortium and resource sharing is the norm. There is an online catalog to the collection and it includes print as well as electronic resources. A reference desk may still exist, but "Ask a librarian" service is available online and sometimes it is offered 24/7. This service may have different forms – e-mail, chat, instant messaging, etc. Bibliographic instruction sessions are presented and usually include information on evaluation of web resources and copyright issues. The Librarian is probably involved with educating faculty and students about issues in scholarly communication. Terms like *open access, intellectual property rights, institutional repositories, metadata*, and *knowledge*

management are part of our vocabulary. Document delivery is electronic. Wireless access is provided campus wide. More users in the library have their own laptops and use library space for many functions. Demand for group work space is increasing and many libraries provide computer workstations designed for group projects. Collection development activities are affected by large package deals such as GeoScienceWorld, AGU Digital Library, Lyell Collection, AAPG Datapages, as well as publisher serial and electronic book collections such as Elsevier, Springer and Wiley. Now the decisions the collection manager needs to make are:

1. Should there be two copies, one print and one electronic?
2. Should I wait for a title to come electronically through some package deal?
3. Is the electronic version the best format for this title?

More acquisition money is used to purchase the large packages so less is available for ordering individual items. Collecting and evaluating web resources is now part of collection development. More government (national and state) maps and reports are online now, and keeping up with these and providing access is a challenge for both collection managers and catalogers. Preservation and access to older materials is increasingly a concern.

THE FUTURE

Where are we heading?

There have been several articles or reports recently on the future of libraries. I will mention four of them here. First, the April issue of *C&RL News* included an article listing the top 10 assumptions for the future of academic libraries. Here are their top assumptions in their ranked order (Mullins, Allen, and Hufford, 2007).

1. There will be an increased emphasis on digitizing collections, preserving digital archives, and improving methods of data storage and retrieval.
2. The skill set for librarians will continue to evolve in response to the needs and expectations of the changing populations (student and faculty) that they serve.
3. Students and faculty will increasingly demand faster and greater access to services.
4. Debates about intellectual property will become increasingly common in higher education.
5. The demand for technology-related services will grow and require additional funding.
6. Higher education will increasingly view the institution as a business.
7. Students will increasingly view themselves as customers and consumers, expecting high quality facilities and services.
8. Distance learning will be an increasingly common option in higher education and will co-exist but not threaten the traditional bricks-and-mortar model.
9. Free, public access to information stemming from publicly funded research will continue to grow.
10. Privacy will continue to be an important issue in librarianship.

David W. Lewis (2007) in a paper deposited in the IUPUI Digital Archive lists five components to a strategic model for academic libraries in the first quarter of the twenty-first century. These are:

1. Complete the migration from print to electronic collections.
2. Retire legacy print collections.
3. Redevelop library space.
4. Reposition library and information tools, resources, and expertise.
5. Migrate the focus of collections from purchasing materials to curating content.

Thomas Frey, Executive Director of the DaVinci Institute and futurist, has an article, "The future of Libraries, Beginning the Great Transformation," on the Institute's web site (2007). He identifies ten trends.

1. Communication systems are continually changing the way people access information.
2. All technology ends. All technologies commonly used today will be replaced by something new.
3. We haven't yet reached the ultimate small particle for storage.
4. Search Technology will become increasingly more complicated.
5. Time compression is changing the lifestyle of library patrons.
6. Over time we will be transitioning to a verbal society.

7. The demand for global information is growing exponentially.
8. The stage is being set for a new era of Global Systems.
9. We are transitioning from a product-based economy to an experience based economy.
10. Libraries will transition from a center of information to a center of culture.

In the December 9, 2005 issue of the *Chronicle of Higher Education*, James G. Neal, University Librarian at Columbia University, in an article envisioning the development of the academic library over the next ten years, stated these "musts" for libraries beyond what we do now:

1. We must expand our role as scholarly publishers.
2. We must expand our role as educators and become agents of literacy and information understanding.
3. We must evolve as robust research-and-development organizations.
4. We must leverage our assets as entrepreneurs in the information marketplace.
5. Libraries must represent public and academic interests in effective public-policy advocacy.

In addition, in March 2007, I sent a question to the GeoNet-L asking what members thought the geoscience library would be like in 2017. Let me briefly summarize the responses before I give you my predictions.

The responses from GeoNet-L can be roughly grouped into three categories: resources, library as place, and librarians/library staff. Some of the responses were wishes and some were predictions but I have grouped them together.

Resources

1. Streaming videos online and in-depth indexing of videos to include concepts, images, indexed as well as subjects.
2. Access material from anywhere and at anytime. Don't have to return materials: they will simply disappear from the computer when the loan period ends.
3. Federated searching of everything.
4. Better catalog records for example: more analytics for series and tables of contents and maybe indexes for books, particularly for print materials in storage.
5. Date-stamped archives of electronic maps, either a print copy or archive digital copies, so there is a map of record for a place at a specific time.
6. Print maps and books will still be with us.

Library as place

1. More computers, better resolution display, more handheld computers.
2. Wireless, Internet2.0 or beyond.
3. Library as place will be more important than it is today.
4. Physical collection will be smaller with more digital access to materials.
5. The Library gateway is very important.
6. Large plotter printer/copiers for maps online.
7. Library will be a laboratory for access to geospatial information sources.
8. Library will be a place to get help, take refuge, and connect with people.

Librarians/Library staff

1. Will have to deal with licensing and copyright issues.
2. Provide technical training and assistance to customers
3. Help faculty (and students) deal with the integration of all the electronic "stuff" into courses.
4. Management of electronic resources – not sure what the online catalog will look like in 10 years or if there will be one.
5. Maintain "library as place" on the internet; provide filters to all the "stuff" on the internet.
6. Publication of primary data will be more and more important. Librarians should define their role in the process (data curators, managing systems, databases...).
7. Still will be teaching students how to use library resources to do research.
8. Librarians will be the guides through the information swamp.
9. Libraries will have digital preservation experts on their staff.

Two other trends we need to consider are:

1. The formation of the new Geological Society of America Geoinformatics Division approved at the 2006 GSA Annual meeting. "The new Geoinformatics Division of GSA with a mission of promoting 'Data to

Knowledge' provides the GSA membership an opportunity to participate in the emerging field of cyberinfrastructure." (Geological Society of America, Geoinformatics Division 2007)

2. The iSchool movement, "The iSchools are interested in the relationship between information, technology, and people." (iSchools 2007)

So what will the Geoscience Library look like in 2017? What will librarians be doing? After reviewing all this information I have compiled my list of predictions and someone else in 2017 can present a paper about the outcome of these.

My predictions for 2017

1. One of the fundamental skills in library science is organization. This skill is going to continue to be needed; but what we organize, how we organize, what tools we use, and the end product will be different from our databases, web sites, and online catalogs of today. The online library catalog and federated searching as we know them today will evolve into something that is much more efficient.
2. Librarians will be involved with the management (organization and archiving) of data for researchers.
3. Geoscience librarians will be part of the Geoinformatics team.
4. Google Book Project will be just one of many projects; and as more and more information is digital, there will be a need for improved metadata to insure successful retrieval of the information and the new search engines.
5. Print materials will continue to be produced and the debate about archiving print copies of digital materials will be resolved. Digital archives will be accepted.
6. The "Library as place" will still be important, but library space will be used differently. Space will still be an issue but there will be more cooperation and coordination among book and serial depositories so that much duplication will be eliminated.
7. Copyright and intellectual property issues will continue as hot topics for a while but the issues will eventually be resolved. Open access and changes in scholarly communication will also continue to be debated; but as the copyright and intellectual property issues are resolved, this will move ahead or be replaced by some new model of knowledge exchange.
8. Human librarians will still be necessary. Our role of bringing the user together with the information they seek will expand and change as the technology of information changes.
9. The service expectations of our users will continue to increase. As we rise to meet their needs, they will expect more, faster, better service.
10. Change will continue.

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